

Sun Sun

CONTACT INFORMATION

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RESEARCH INTERESTS

I am generally interested in stochastic optimization, distributed control, online learning, signal processing, and information technology. My goal is to employ computational tools in cyber-physical systems, so as to 1) develop intelligent algorithms that improve system performance (e.g., reliability, robustness, and cost effectiveness), and 2) design low-complexity control strategies for the system operators and users. My Ph.D. work focuses on modern power and energy systems with high-penetration of intermittent, unpredictable renewables (e.g., wind and solar). My work spans a wide range of topics such as power system modeling, energy storage, and demand response. I also worked on channel estimation and decoding in wireless communications in my masters.

EDUCATION

Ph.D., Electrical and Computer Engineering, University of Toronto, Canada
09/2011 - 11/2015

- Supervisors: Ben Liang and Min Dong
- Thesis: Management of electrical grids with storage and flexible loads under high-penetration renewables

M.Sc., Electrical and Computer Engineering, University of Alberta, Canada
09/2009 - 08/2011

- Supervisor: Yindi Jing
- Thesis: Channel training and decodings for multiple-input-multiple-output (MIMO) relay networks

B.En., Electrical Engineering and Automation, Tongji University, China
09/2001 - 07/2005

HONORS AND AWARDS

- Ontario Graduate Scholarship 2014-2015
- SGS Conference Grant, University of Toronto 2013
- University of Toronto Fellowship 2011-2015
- University of Alberta Fellowship 2009-2011
- Excellent students scholarship of Tongji University 2001-2005

JOURNAL ARTICLES

1. *Phase balancing using energy storage in power grids under uncertainty*
Sun Sun, Min Dong, Ben Liang, and Josh Taylor
To appear in IEEE Transactions on Power Systems.
2. *Distributed real-time algorithm for renewable-integrated power grids with storage and flexible loads*
Sun Sun, Min Dong, and Ben Liang
To appear in IEEE Transactions on Smart Grid.

3. *Real-time power balancing in electric grids with distributed storage*
Sun Sun, Min Dong, and Ben Liang
 IEEE Journal of Selected Topics in Signal Processing (special issue on signal processing in smart electric power grid), vol. 8, no. 6, pp. 1167-1181, Dec. 2014.
4. *Real-time welfare-maximizing regulation allocation in dynamic aggregator-EVs system*
Sun Sun, Min Dong, and Ben Liang
 IEEE Transactions on Smart Grid, vol. 5, no. 3, pp. 1397-1409, May 2014.
5. *On stochastic feedback control for multi-antenna beamforming: formulation and low-complexity algorithms*
Sun Sun, Min Dong, and Ben Liang
 IEEE Transactions on Wireless Communications, vol. 13, no. 9, pp. 4731-4745, Sep. 2014.
6. *Training and decodings for cooperative network with multiple relays and receive antennas*
Sun Sun and Yindi Jing
 IEEE Transactions on Communications, vol. 60, no. 6, pp. 1534-1544, Jun. 2012.
7. *Channel training design in amplify-and-forward MIMO relay networks*
Sun Sun and Yindi Jing
 IEEE Transactions on Wireless Communications, vol. 10, no. 10, pp. 3380-3391, Oct. 2011.

CONFERENCE
PAPERS

1. *Cost-minimizing distributed algorithm for managing renewable-integrated power grids (invited paper)*
Sun Sun, Min Dong, and Ben Liang
 IEEE Global Conference on Signal and Information Processing (GlobalSIP), Dec. 2015.
2. *Distributed real-time phase balancing for power grids with energy storage*
Sun Sun, Josh Taylor, Min Dong, and Ben Liang
 American Control Conference (ACC), Jul. 2015.
3. *Joint supply, demand, and energy storage management towards microgrid cost minimization*
Sun Sun, Min Dong, and Ben Liang
 IEEE Conference on Smart Grid Communications (SmartGridComm), Nov. 2014.
4. *Distributed regulation allocation with aggregator coordinated electric vehicles*
Sun Sun, Min Dong, and Ben Liang
 IEEE Conference on Smart Grid Communications (SmartGridComm), Oct. 2013.
5. *Real-time welfare-maximizing regulation allocation in aggregator-EVs systems*
Sun Sun, Min Dong, and Ben Liang
 IEEE Conference on Computer Communications (INFOCOM) Workshop on Communications and Control for Smart Energy Systems (CCSES), Apr. 2013.
6. *Channel training and coherent decodings in amplify-and-forward relay network*
Sun Sun and Yindi Jing
 IEEE Global Communications Conference (GlobeCom), Dec. 2011.
7. *Channel training and estimation in distributed space-time coded relay networks with multiple transmit/receive antennas*
Sun Sun and Yindi Jing
 IEEE Wireless Communications and Networking Conference (WCNC), Apr. 2010.

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| RESEARCH EXPERIENCE | <ul style="list-style-type: none"> Research Assistant 09/2011 - 11/2015 Department of Electrical and Computer Engineering, University of Toronto Supervisor: Ben Liang and Min Dong Topic: energy management in power grids under renewable integration Research Assistant 09/2009 - 08/2011 Department of Electrical and Computer Engineering, University of Alberta Supervisor: Yindi Jing Topic: channel training and estimation in wireless communications |
| SERVICE (REVIEWER) | IEEE Transactions on Smart Grid IEEE Transactions on Wireless Communications IEEE Wireless Communications Letters IEEE International Conference on Computer Communications (INFOCOM) IEEE International Conference on Smart Grid Communications (SmartGridComm) |
| TEACHING | Fall 2014, Teaching assistant for <i>Communication Systems</i> , University of Toronto Fall 2013, Teaching assistant for <i>Random Processes</i> , University of Toronto Fall 2012, Guest lecturer for <i>Random Processes</i> , University of Toronto Fall 2010, TA for <i>Discrete Time Signals and Systems</i> , University of Alberta |
| INDUSTRY EXPERIENCE | <ul style="list-style-type: none"> Software engineer & technical leader, Huawei Technologies Co., Ltd, Shanghai, China 04/2006 - 12/2008 Software engineer, KEIHIN R&D, China 08/2005 - 03/2006 |
| PROGRAMMING | Matlab, C/C++ |